Disk Sector Status

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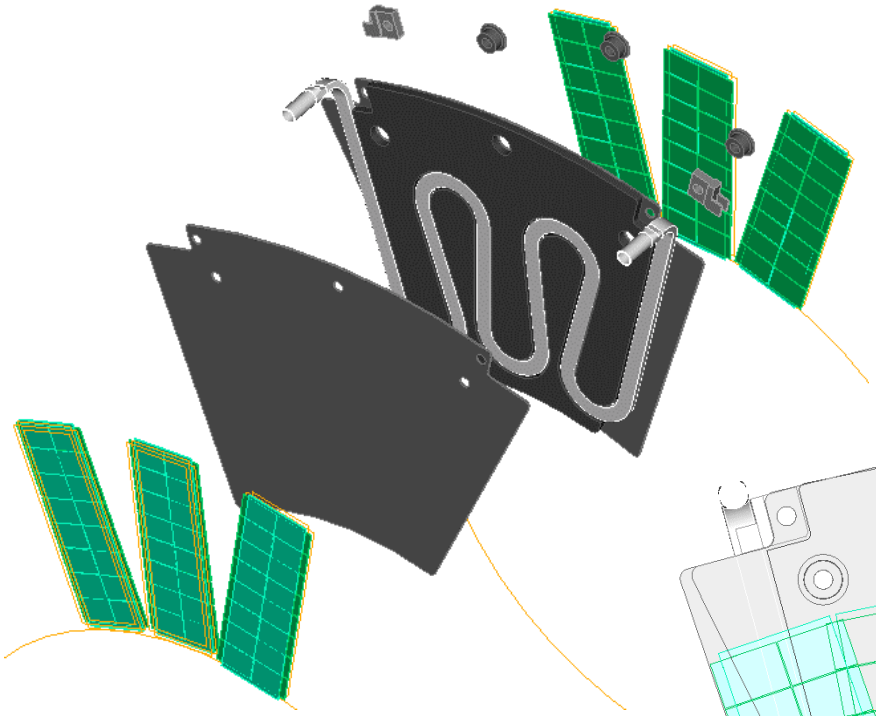
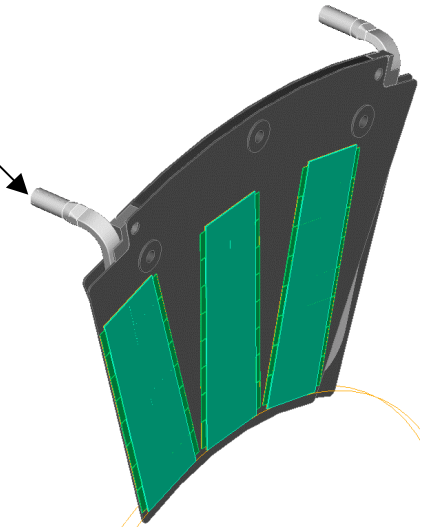
CAD Model/Drawings

- Model/drawing set for update to 8-sector design and associated tooling well advanced but not yet frozen
  - This is requiring regular meetings(about weekly) to make sure all design elements and interfaces are properly addressed(support rings, assembly tooling, module attachment, services strain relief…..)
  - Still to be resolved are primarily strain relief(of pigtails) and impact on disk ring. Have decided to decouple strain relief from sector design to make progress => strain relief will be glued-on features.
  - Need to implement formal sign-off procedures via EDMS once model/drawing set is deemed complete.
  - Timescale for completion: mid-January
- Changes to requirements document(hopefully final) understood(with exception of specification on number of pressure cycles around nominal pressure) and ready to include before or after similar changes for stave.

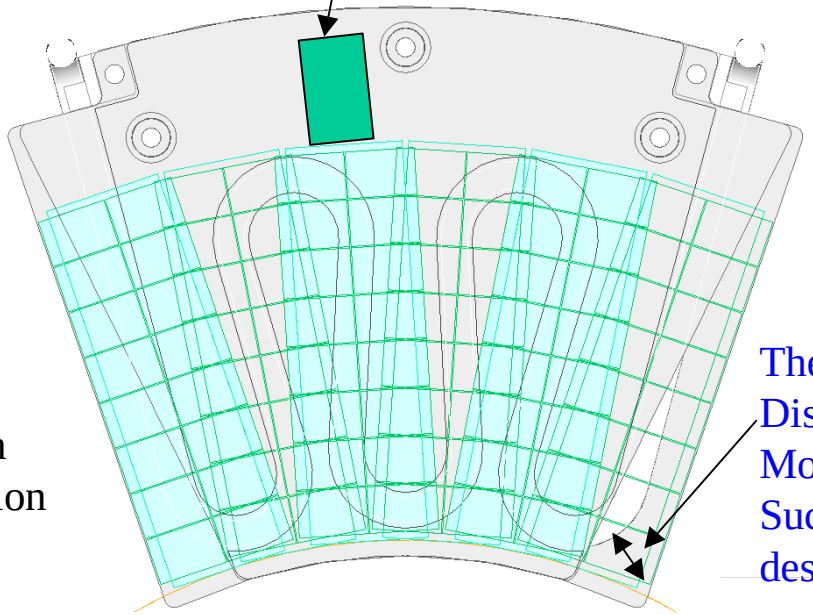
Updated Sector Model



New tube model still necessary for first reversed disk



Pigtail width of 12mm is now possible with the 8-sector



Thermal figure of merit Distance from tube to Module corner same as Successful 11-Sector designs

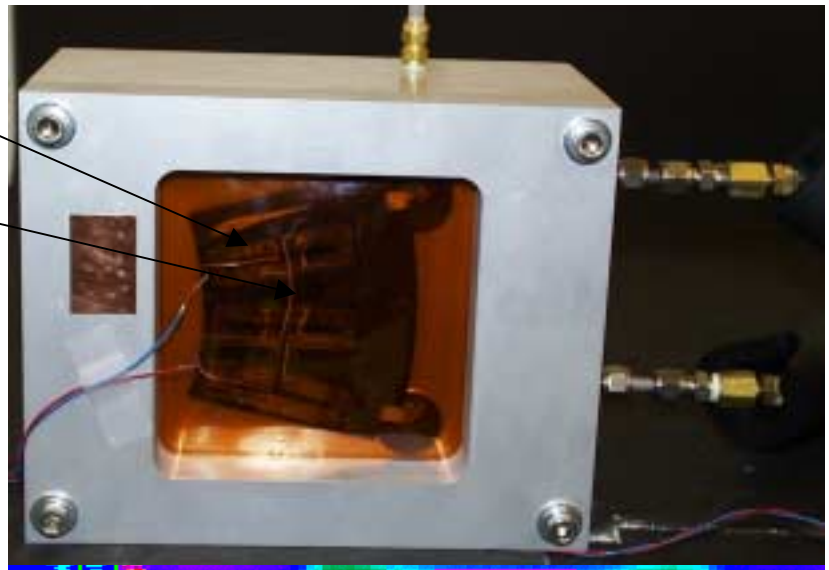
Next Sector prototype will be built using drawing package extracted from this model. First step toward production sector.

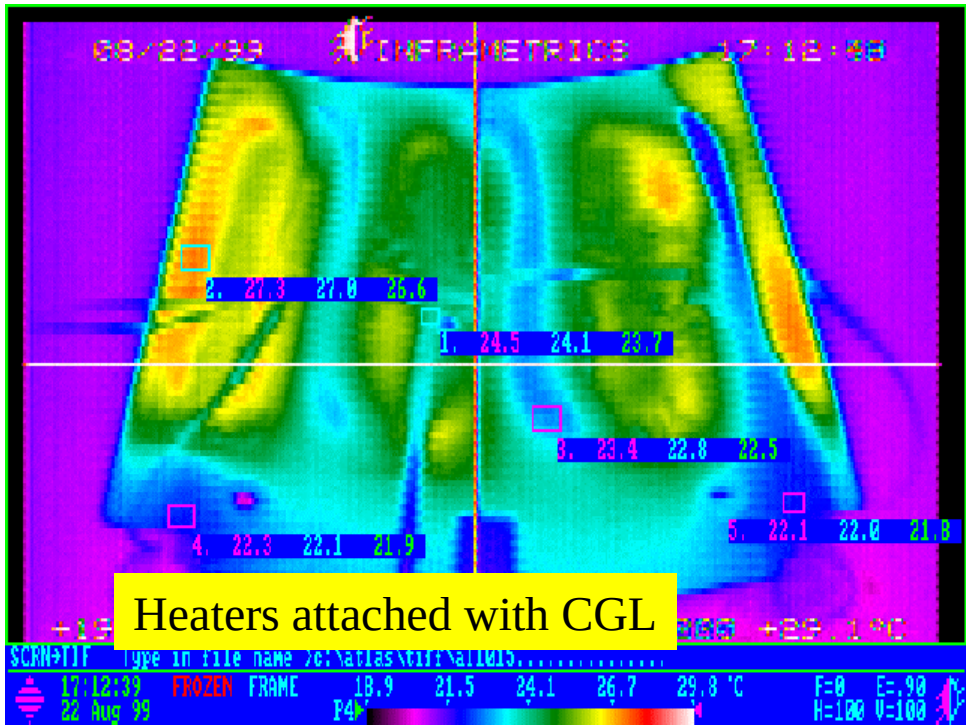
Sector Thermal QA

- Proof of principle for thermal QA has been demonstrated. Need this in production to check quality of construction.
- Uses “vacuum bag” technique to bring heaters into contact with sector without any CGL or other material, then use normal IR thermography - see next page
- Next step is to make production version to allow imaging on both sides, perhaps improve contact by using compliant layer permanently bonded to heaters.
- This work on hold because of more urgent matters…expect first production jig ready by April 2000.

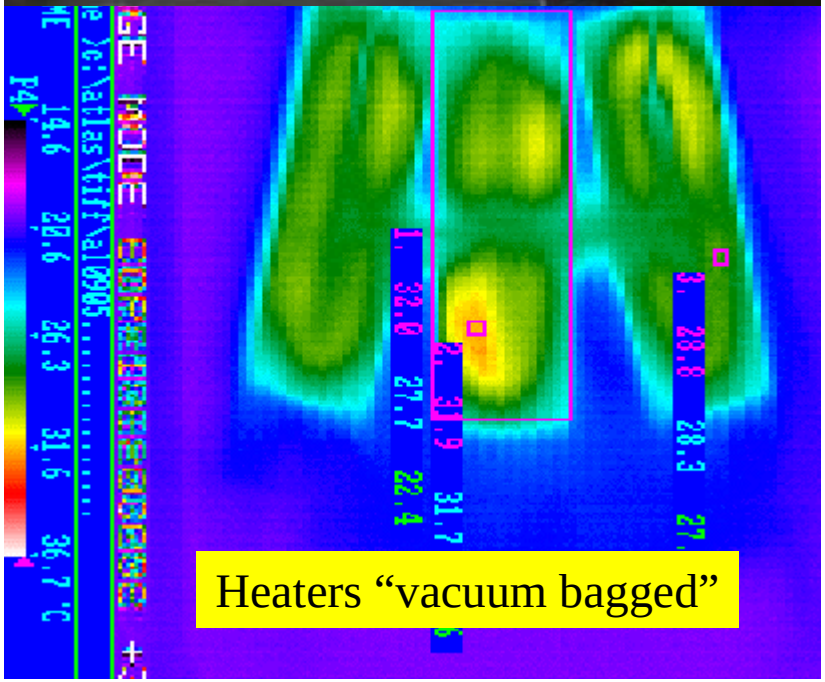
Thermal QA of Sector

- Regular Pt-on-silicon heaters
- Held by vacuum to sector
- No grease or adhesive
- Temperature differential higher
- But can correlate





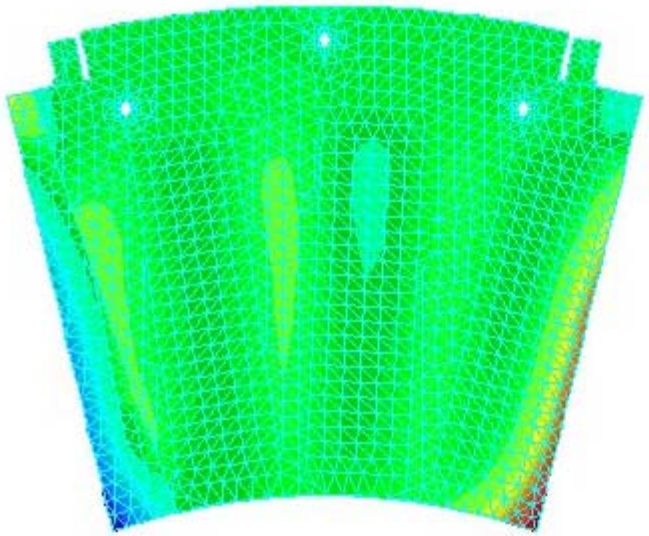
Heaters attached with CGL



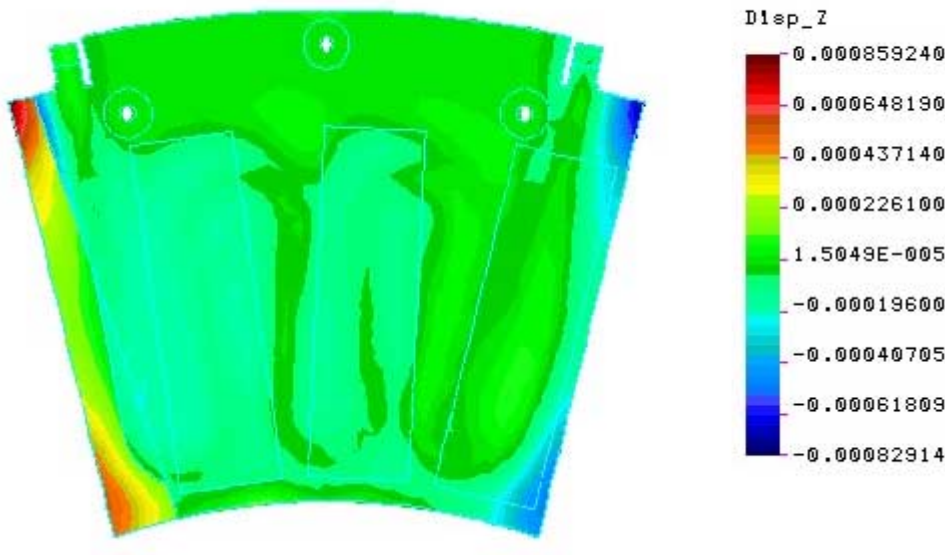
Heaters “vacuum bagged”

Outstanding Technical Issues(1)

- Primary issue is use of rigid bonding of aluminum tube to sector.
- FEA done by W. Miller indicates that distortions should be acceptable, comparable to those expected for baseline construction that uses primarily CGL-7018(which passes all tests).
- Will build prototype with “rigid” adhesive starting January



With CGL(shear modulus 0.021 N/mm^2) maximum is about 1.2μ/^{o}C



With “rigid” adhesive(shear modulus 980 N/mm^2) maximum is about 0.54μ/^{o}C. Note change in direction of deflection.

Z-normal to sector surface, positive direction toward observer. Units cm.

Outstanding Technical Issues(2)

- A technical issue remains comparison of FEA done by W. Miller with measurements of deflections under thermal change. Data not good enough.
- TV holography system now operational at LBL and will be used for this purpose starting in January.
- This is not something that would prevent start of production, since predictions and (poor) measurements are well within spec. Nevertheless annoying not to have good data on basic item. Believe resolution of optical CMM(out-of-plane) not good enough for maximum motions of 1 micron/^{o}C in limited regions and 20^{o}C temperature change. TVH resolution is 20 times better.

Production Preparations

- In addition to final drawings…..
- Vendor for aluminum tube identified and order is ready to be placed.
- Discussions leading to preliminary specification and quote for 20 carbon-carbon plates(50x50cm^2) to be used for both support rings and sector faceplates well advanced. Will be ready to place order in January.
- Next prototype sectors made will be to 8-sector design. Materials for these in hand, but tooling to be completed by January.
- Have started thinking about part numbering and what to implement in production database. Want to try out with prototype construction, including database entry.
- Detailed production schedule under preparation by mid-January.